

## CLAIMS

What is claimed is:

1. A catalytic converter subassembly comprising:  
a shell, said shell having an opening; and  
an exhaust manifold having an outlet, said outlet secured to said opening to form a gas tight seal.
2. The catalytic converter subassembly recited in Claim 1, wherein said seal is formed by insertion of one end of said shell aligned with said outlet in a mold when casting an exhaust manifold.
3. The catalytic converter subassembly recited in Claim 2, wherein said shell is concentrically disposed around a mat protection ring secured by insertion of one end of said mat protection ring in a mold when casting an exhaust manifold.
4. The catalytic converter subassembly recited in Claim 3, wherein said shell and said mat protection ring each have said one end further comprising a retaining feature for retention in said exhaust manifold.
5. The catalytic converter subassembly recited in Claim 4, wherein said retaining feature is selected from at least one of bumps, flares, grooves, and any combination comprising at least one of the foregoing.
6. The catalytic converter subassembly recited in Claim 2, wherein said shell comprises an outer endcone concentrically disposed around an inner endcone, said outer endcone and said inner endcone each having ends aligned with said outlet in a mold when casting an exhaust manifold.
7. The catalytic converter subassembly recited in Claim 6, wherein said outer endcone and said inner endcone each have said ends further comprising a retaining feature for retention in said exhaust manifold.

8. The catalytic converter subassembly recited in Claim 7, wherein said retaining feature is selected from at least one of bumps, flares, grooves, and any combination comprising at least one of the foregoing.

9. A method of manufacturing a catalytic converter subassembly comprising:

forming a shell having an opening;

forming a catalyst substrate comprising a catalyst;

5 disposing said catalyst substrate concentrically within said shell;

disposing said mat support material concentrically in between said catalyst substrate and said shell; and

forming an exhaust manifold with an exhaust outlet coupled to said opening by insertion of said opening in a mold for casting said exhaust

10 manifold.

10. A method of manufacturing a catalytic converter subassembly recited in Claim 9, further comprising:

disposing a mat protection ring concentrically within said shell;

and

5 contacting said mat support material with said mat protection ring.

11. A method recited in Claim 10, wherein securing said shell and said mat protection ring further comprises insertion of one end of said shell and one end of said mat protection ring in a mold for casting an exhaust manifold aligned with a portion of said mold designated for said outlet.

12. The method recited in Claim 11, wherein said shell and said mat protection ring are formed each having said ends further comprising a retaining feature for retention in said exhaust manifold.

13. The method recited in Claim 12, wherein said retaining feature is selected from at least one of bumps, flares, grooves, and any combination comprising at least one of the foregoing.

14. A method of manufacturing a catalytic converter subassembly, comprising:

disposing a mat support material concentrically around a catalyst substrate to form an assembly, wherein the catalyst substrate comprises a

5 catalyst;

disposing the assembly concentrically within a containment area of an inner endcone;

disposing the containment area within an inner endcone receiving area of an outer endcone; and

10 securing the inner endcone and the outer endcone to an outlet of an exhaust manifold.

15. The method recited in Claim 14, wherein securing the inner endcone and the outer endcone further comprises insertion of one end of said inner endcone and one end of said outer endcone in a mold for casting an exhaust manifold and aligned with a portion of said mold designated for said

5 outlet.

16. The method recited in Claim 15, wherein said outer endcone and said inner endcone are formed each having said ends further comprising a retaining feature for retention in said exhaust manifold.

17. The method recited in Claim 16, wherein said retaining feature is selected from at least one of bumps, flares, grooves, and any combination comprising at least one of the foregoing.

18. A method of manufacturing a catalytic converter subassembly comprising:

forming a shell having an opening;

aligning said opening within a mold for casting an exhaust 5 manifold; and

casting said exhaust manifold with said opening inserted in a portion of said mold designated for exhaust outlet.

19. The method recited in Claim 18, further comprising:

forming a mat protection ring concentrically within said shell;

aligning an end of said mat protection ring within said mold for casting said exhaust manifold; and

5 casting said exhaust manifold with said end inserted in a portion of said mold designated for exhaust outlet.

20. The method recited in Claim 18, wherein said shell comprises one of a shell tube and an outer endcone concentrically disposed around an inner endcone.

21. The method recited in Claim 20, wherein ends of said shell and said end of said mat protection ring include retaining features for retention in said exhaust manifold.

22. The method recited in Claim 21, wherein said retaining features is selected from at least one of bumps, flares, grooves, and any combination comprising at least one of the foregoing.